

**Bonneville Power Administration
Fish and Wildlife Program FY99 Proposal**

Section 1. General administrative information

Kirby (Atlanta) Dam Fish Ladder

Bonneville project number, if an ongoing project 9053

Business name of agency, institution or organization requesting funding

Joint sponsors: USDA Forest Service, Boise National Forest - Idaho Dept. Fish & Game

Business acronym (if appropriate) BNF

Proposal contact person or principal investigator:

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Subcontractors.

Organization	Mailing Address	City, ST Zip	Contact Name
Idaho Fish & Game	3101 S Powerline	Nampa, ID 83686	Scott Grunder

NPPC Program Measure Number(s) which this project addresses.

new project

NMFS Biological Opinion Number(s) which this project addresses.

na

Other planning document references.

Boise River Key Watersheds Bull Trout Problem Assessment (Southwest Basin Native Fish Watershed Advisory Group 1998), BNF Land and Resource Mgt. Plan, pages IV-22 and IV-29; (Boise National Forest 1991)

Subbasin.

North and Middle Fork Boise - 17050111

Short description.

Design and construct a fish ladder at Kirby Dam, near Atlanta, Idaho to restore approximately 56.6 miles of stream to spawning and early rearing of bull trout in the Middle Fork Boise River Basin. This project would restore 39% of their historic range.

Section 2. Key words

Mark	Programmatic Categories	Mark	Activities	Mark	Project Types
	Anadromous fish	X	Construction	X	Watershed
X	Resident fish		O & M	+	Biodiversity/genetics
	Wildlife		Production	+	Population dynamics
	Oceans/estuaries		Research	+	Ecosystems
	Climate	+	Monitoring/eval.	+	Flow/survival
	Other		Resource mgmt		Fish disease
			Planning/admin.		Supplementation
			Enforcement		Wildlife habitat en-
			Acquisitions		hancement/restoration

Other keywords.

migration, spawning/early rearing

Section 3. Relationships to other Bonneville projects

Project #	Project title/description	Nature of relationship

Section 4. Objectives, tasks and schedules**Objectives and tasks**

Obj 1,2,3	Objective	Task a,b,c	Task
1	Construct fish ladder	a	Install fishpass

2	Monitor effectiveness	a	Tag and sample fish

Objective schedules and costs

Objective #	Start Date mm/yyyy	End Date mm/yyyy	Cost %
1	10/1998	1/1999	90.00%
2	4/1999	11/1999	10.00%
			TOTAL 100.00%

Schedule constraints.

Let contract in spring/summer 1998. Begin construction in October, 1998. Complete construction by end of calendar year 1998. Begin monitoring when bull trout begin migration in the spring of 1999. No constraints are anticipated other than weather.

Completion date.

1999

Section 5. Budget

FY99 budget by line item

Item	Note	FY99
Personnel	Engineering and construction	\$50,000
Fringe benefits	Overhead @ 20%	\$50,000
Supplies, materials, non-expendable property	Fish ladder	\$175,000
Operations & maintenance		
Capital acquisitions or improvements (e.g. land, buildings, major equip.)		
PIT tags	# of tags:	
Travel		
Indirect costs		
Subcontracts		
Other	Misc.	\$25,000
TOTAL		\$300,000

Outyear costs

Outyear costs	FY2000	FY01	FY02	FY03
Total budget				
O&M as % of total				

Section 6. Abstract

The goal is to restore bull trout access to historical spawning/rearing habitats. Populations are currently isolated by 3 dams, greatly increasing the risks of extinction. Fish passage at Kirby dam would restore about 39 percent of the critical historical habitats used in early life stages. Studies by Idaho Department of Fish and Game and Boise National Forest (Burton 1996) show that bull trout historically occupied habitats above Kirby Dam. The Idaho Native Fishes Watershed Advisory Committee recently drafted a problem assessment that identified restoring fish passage at Kirby Dam as one of the highest priorities in the Basin (SWBNFWAG 1998). Opportunities for restoring access above Kirby Dam were investigated by Joe Teter, an expert in design and operation of fish passage facilities (Teter 1997). He is confident that regrading the natural rock channel below the dam combined with construction of a Denil Type fishladder over the dam itself will pass bull trout to the upper stream. The lower rock channel spillway rises 19 feet to the base of the dam structure. The dam itself rises an additional 16 feet above the rock channel. The expert recommends a “swim-through” design to mimic natural stream conditions, rather than a “pool and weir” design. Design of the passage facility is currently under development by Engineers with Idaho Department of Fish and Game and the Bureau of Reclamation. A final design report is due January 23, 1998 (Jeppson 1998). Project construction would be completed by the end of 1998 and monitoring would occur over several years starting in 1999.

Section 7. Project description

a. Technical and/or scientific background.

The Atlanta Dam and Power Plant were originally constructed by Atlanta Miners Company in 1906-07. The original dam was a log crib design. This long-standing structure began failing in the summer of 1990. The dam totally failed in late May 1991. A permanent replacement was completed in 1992 and the Forest Service assumed ownership and control. No fish passage was provided because at that time agencies were in a rush to complete the structure to prevent sediments contained behind the old facility from washing downstream and to restore hydro-electricity to Atlanta. In 1996 and 1997

the Idaho Department of Fish and Game conducted tagging studies on adfluvial bull trout in the Boise Basin and the Southwest Basin Native Fishes Watershed Advisory Committee completed a problem assessment for bull trout in the Boise River Key Watersheds (Flatter - in press). These studies concluded that fish passage at Kirby Dam represents a significant opportunity to enhance bull trout production and likely restore population resilience that has been lost to habitat fragmentation. In addition, the Idaho Department of Fish and Game recognizes fish passage at Atlanta Dam as one of the highest priorities in the Boise River Key Watershed (Grunder 1997). Habitat fragmentation in the Boise Basin has resulted from construction of 3 dams (Arrowrock, Anderson Ranch, and Kirby Dams). Based on research by Rieman and McIntyre (1995), the bulk of bull trout spawning and rearing occurs at high elevation (above 5000 feet). Kirby dam is highest among the 3 dams (just below 5000 feet), and a fish passage facility on this dam represents the greatest opportunity to restore bull trout to their historic levels. Analysis of data collected by the Boise National Forest indicated that existing bull trout spawning/initial rearing habitats in the basin totaled 145 miles and that fish passage at Atlanta Dam would add approximately 57 miles for bull trout production (Burton 1996). In addition, habitat quality analysis by the Boise National Forest indicated that spawning and early rearing areas above Kirby Dam were comparable in condition to strong bull trout production habitats elsewhere in the Basin.

The potential for expanding bull trout production to habitats above Kirby Dam is considered high because bull trout are known to have populated this area historically, existing habitats match the criteria for spawning and early rearing based on research in the Boise Basin (Rieman and McIntyre 1995), and because incidental observations of residual bull trout upstream of the dam have been made in recent years (Burton 1996). For bull trout populations to persist over the long term, they must be sufficiently large and composed of enough sub-populations to survive catastrophic events, effects of human activities, and effects of normal environmental variation (Rieman and McIntyre 1993). Researchers suggest that a population should incorporate no fewer than 5 to 10 subpopulations and conservatively many more (Rieman and McIntyre 1993). The proposed fish passage is estimated to increase the numbers of existing subpopulations from 6 to 10 or more healthy subpopulations. Also, several of the existing subpopulations are relatively weak in number and may be at risk of local extinction.

Engineers at the Idaho Department of Fish and Game did preliminary field measurements in the summer of 1996. In 1997 the project was evaluated by an expert with 13 years of experience with fishpass design and construction (Teter 1997). He evaluated 6 alternatives, including trapping and trucking fish around the barrier, a fishpass within the existing spill way, a structure that penetrates the existing embankment dam, tapping an existing powerplant penstock, and alternative fishpass structures either side of the existing concrete spillway. These alternatives were evaluated in development of the engineering designs. The designs will be completed in early 1998 (Jeppson, in press).

b. Proposal objectives.

Primary objective: To restore connectivity of the Upper Middle Fork Boise River and tributaries with the migratory and over-wintering habitats of the lower Boise River and Arrowrock Reservoir by constructing a fish passage facility at Kirby Dam.

Bull trout production objective: Analysis of bull trout densities in habitats comparable to the Upper Middle Fork Boise River above Kirby Dam indicated an average bull trout density of approximately 1.1 per 100 square meters. Using the average, the projected production of bull trout above Kirby Dam is roughly 10,000 fish.

Bull trout population viability objective: The objective is to increase the number of subpopulations to 10 or more, comprising at least 6 strong subpopulations.

c. Rationale and significance to Regional Programs.

Bull trout are proposed for listing as “threatened” under the Endangered Species Act. Restoration of population viability is a major objective of the cooperating agencies and this proposal would significantly increase the probability of population persistence in the Boise Basin. This objective is consistent with the goals of the FWP to enhance and restore fish and wildlife in the Columbia Basin.

d. Project history

New project.

e. Methods.

Engineering methods are described in detail in Teter (1997) and Jeppson (in press). Teter recommends that regrading the natural rock channel below the dam combined with construction of a Denil Type fishladder over the dam itself will pass bull trout to the upper stream. The lower rock channel spillway rises 19 feet to the base of the dam structure. The dam itself rises an additional 16 feet above the rock channel. Teter recommends a “swim-through” design to mimic natural stream conditions, rather than a “pool and weir” design. To provide adequate passage, the rock channel spillway would be regraded by blasting to a slope and roughness suitable for migration. At the concrete spill, an inlet at the northeast wall would access a fishpass built outside the concrete spill structure and pass over the dam on its north side. The fishpass would extend into the impoundment paralleling the road fill. One possible difficulty is excavating the rock between the basin training wall and the county road. Engineering design will have to address the hardrock excavation close to the concrete wall and adjacent fill toe of the

road. Currently the Idaho Department of Fish and Game and Bureau of Reclamation are putting the finishing touches on the fish passage design. A pending report will provide engineering details and more refined cost estimates. The report is expected by January 23, 1998. Biological monitoring would include tagging of adult fish entering the facility and evaluating out-migration of juveniles. Redd counts would be conducted upstream of the fishpass.

f. Facilities and equipment.

There will be no capital expenditures.

g. References.

References

Burton, T. 1996. Proposed bull trout restoration - upper Middle Fork Boise River above Kirby Dam. Boise National Forest. Boise, Idaho.

Flatter, B. J. *In press*. Life History of Bull Trout (*Salvelinus confluentus*) in The upper Boise River Drainage, Idaho. A report to the Bureau of Reclamation. Idaho Department of Fish and Game, Boise, Idaho.

Grunder, S. 1997. Bull Trout Restoration Above Atlanta Dam, Middle Fork Boise River -- A Bull Trout Key Watershed. Prepared for Boise National Forest. Idaho Department of Fish and Game, Boise, Idaho.

Jeppson, P. *In press*. Engineering designs for fish passage at the Atlanta Dam, Middle Fork Boise River. Idaho Department of Fish and Game, Boise, Idaho.

Rieman, B.E. and J.D. McIntyre. 1993. Demographic and Habitat Requirements for Conservation of Bull Trout. U.S.D.A. Forest Service, Intermountain Research Station, General Tech. Report INT-302.

Rieman, B.E. and J.D. McIntyre. 1995. Occurrence of Bull Trout in Naturally Fragmented Habitat Patches of Varied Size. Transactions of the American Fisheries Society, Volume 124, No. 3.

Southwest Basin Native Fish Watershed Advisory Group (SBNFWAG). 1998. Boise River Key Watersheds Bull Trout Problem Assessment. Prepared for State of Idaho.

Teter, J. 1997. Bull Trout Passage at Atlanta (Kirby) Dam. Report prepared for the Boise National Forest. December 1, 1997.

Section 8. Relationships to other projects

The project is unrelated to other work currently funded under the FWP. The project will require a section 404 permit for stream channel alteration from the Idaho Department of Water Resources and Corps of Engineers.

Section 9. Key personnel

Project manager: Rich Christensen, Engineering & Planning Staff Officer, Boise National Forest. Duties: overall project leadership

Assistant project manager: Phil Jeppson, Engineering Bureau Chief, Idaho Department of Fish and Game. Duties: development of project design and construction supervision.

Biological Support Team: Tim Burton, Fisheries Program Leader, Boise National Forest; Scott Grunder, Natural Resources Biologist, Idaho Department of Fish and Game Region 3; Rick Rieber, Fisheries Biologist, Bureau of Reclamation. Duties: fisheries consultation.

Engineering crew: Either personnel of Idaho Department of Fish and Game or contracted. Duties - construct fish ladder and regrade rock spillway.

Engineering design support: Bureau of Reclamation Engineer and Rick Gunn, Engineer, Boise National Forest. Duties - review technical design details relevant to design of the dam and the road.

Public relations: Hal Gibbs, District Ranger, Boise National Forest. Duties - coordinate project activity with Atlanta Power Company and other publics.

Section 10. Information/technology transfer

Will consider publication of results in scientific journal.